

## CASE REPORT

# Physiological periostitis; a potential pitfall

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**P**hysiological periostitis is a known radiological finding in infants aged between 1 and 6 months. Two children with physiological periostitis mistaken for non-accidental injury are described. In both these patients only one limb was imaged and failure to image the contralateral limb led to unnecessary skeletal survey and distress for the families.

### CASE 1

A 3 month old infant was admitted with a 24 hour history of reluctance to move her right leg. There was no history of trauma, fever, or malaise. A radiograph of the right leg was reported to show a periosteal reaction at the lateral aspect of the femur consistent with a fracture. The parents could not explain the suspected injury and a Child Protection investigation was done which found no pointers to abuse. A skeletal survey showed no other fracture but a similar appearance in the corresponding area of the left femur leading to a revised diagnosis of physiological periostitis<sup>1</sup> (fig 1). The infant's symptoms did not improve and two days after presentation the following abnormal investigations were obtained: neutrophils  $17 \times 10^9/l$ , C reactive protein 17 units, erythrocyte sedimentation rate 62 mm/hour. Blood culture was negative.

A radionuclide bone scan showed increased uptake at the lower end of the right femur on day 6 and a radiograph confirmed osteomyelitis (fig 2). On open exploration under anaesthesia, pus was drained from which group C streptococcus was cultured. Following a six week course of antibiotics she made a complete recovery.

### CASE 2

A 6 week old baby girl was admitted with a swollen left thigh noted on day of admission, and diarrhoea. There was no history of trauma. Pregnancy and delivery had been uneventful but at the newborn examination a possible vaginal cyst was noted.

On examination she was afebrile and moving all four limbs normally. Positive findings on examination were a swollen left thigh with no signs of inflammation or bruising and a bulging hymen.



**Figure 1** Radiograph in case 1 showing physiological periostitis.

The following abnormal investigations were obtained: D dimer was more than 1000 ng/ml (normal: 0–255 ng/ml), with a normal coagulation screen and a C reactive protein of 44 units. A radiograph of the left femur showed a periosteal reaction. Abdominal ultrasound revealed a haematometracolpos with bilateral hydronephrosis. Doppler studies performed preoperatively showed good arterial and venous flow.

Under general anaesthesia a hymenotomy was performed and the turbid fluid under pressure was drained. The leg swelling resolved following surgery and the repeat ultrasound showed resolution of bilateral hydronephrosis. In view of the suspected fracture of the left femur a skeletal survey was performed, which showed a similar appearance in the contralateral femur, thus making a diagnosis of physiological periostitis and excluding injury. The patient made an uneventful recovery and the leg swelling was explained, by the haematometracolpos pressing on the left common iliac vein.

### DISCUSSION

Physiological periostitis is a well documented x ray finding in paediatric radiology. It is commonly seen in long bones and is invariably symmetrical in distribution, although occasionally more prominent on one side than the other. The femora, humeri, and tibiae are affected almost equally,<sup>2</sup> but may be limited to one pair of bones initially. Physiological periostitis is seen in both preterm and term babies aged 1–6 months, and the exact aetiology of this condition is unknown. The new bone is not always concentric in its distribution and is present on only one aspect of the bones in some. There is no consistency as to the site of involvement except in the tibia where the new bone is invariably on the medial aspect. It is always on the diaphysis and usually extends onto the metaphysis to a variable extent, but it has not been observed to reach the end of the metaphysis. Traumatic periosteal new



**Figure 2** Radiograph of the right leg of case 1, confirming osteomyelitis.

bone may be bilateral and multiple but there is usually other evidence of fracture or haematoma. This new bone is uneven and extends to the end of the metaphysis in some cases. In infection new bone will not affect multiple bones symmetrically. Physiological periostitis should be considered in suspected bone injury with periosteal reaction only in infants aged 1–6 months.<sup>3</sup>

### Conclusion

These two children were initially incorrectly suspected of having been abused, the appearances of physiological periostitis being mistaken for a fracture until a radiograph on the opposite side showed identical appearances leading to the recognition of physiological periostitis (or periosteal new bone).

These two case reports highlight firstly, the importance of imaging the contralateral limb in this age group when accidental fracture or osteomyelitis is suspected in order to avoid unnecessary skeletal survey, and secondly, radiological findings must be interpreted in the context of clinical

findings so that the risk of serious errors including erroneous suspicion of child abuse are minimised.

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- 3 **Rao P**, Carty H. Non-accidental injury: review of radiology. *Clin Radiol* 1999;**54**:11–24.

## IMAGES IN PAEDIATRICS

### Home oxygen therapy: beware of birthday cakes

The remains of the burnt oxygen nasal cannula belonged to a child with chronic lung disease on home oxygen therapy (HOT). He had always celebrated his birthdays with the usual cake and the appropriate number of candles. Admiring his fourth birthday cake, he lost balance and came too close to the candles. The nasal cannula went up in flames. His hair too. His older sister was cute enough to rip the cannula off his head. Physically, he only suffered from nasalsecond degree burns. His family feels guilty, even more so since everyone knew that oxygen was a combustive agent.

Only adult patients have been reported in the literature to have

suffered from HOT induced burns, which varied from small superficial facial lesions to lethal inhalation injuries.<sup>1</sup> Most of these incidents were caused by cigarette smoking. Young children, luckily, do not normally smoke. They are thus probably less at risk of oxygen induced burns.

When prescribing HOT to paediatric patients, physicians should however remember children's pleasures: birthday cakes and candles—and warn parents accordingly.

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